

XIII. POLYZOA FROM VICTORIA AND WESTERN AUSTRALIA.

Under the present heading I shall continue the account of the Polyzoa dredged by Mr. J. Bracebridge Wilson off Port Phillip Heads, Victoria*. The collection which he has placed in my hands for examination is large and interesting, and I propose to give a complete list of the species contained in it which are not included in MacGillivray's 'Decades,' as well as descriptions of the new forms.

Group *ENTOPROCTA*.

Family *Pedicellinidæ*.

PEDICELLINOPSIS, n. gen.

Generic character.—*Polypides* cup-shaped, supported on chitinous tubes with a much enlarged base (consisting of an opaque white core, probably muscular, enveloped in a chitinous covering), by which they are attached to an erect tubular stem. *Zoarium* adherent by means of tubular root-fibres.

This is a truly arborescent *Pedicellina*, in which the soft parts, with the exception of the polypide itself, are clothed with a well-developed chitinous cœnœcium. The prolongation of the common flesh from which the polypide buds is protected by a chitinous tube, which is open above, and at the base is attached to a stem (also invested with a solid periderm). The root-fibres by which the colony is fixed in its place are sheathed in chitine. The polypide resembles closely that of such a form as *Pedicellina cernua*, and, so far as I can judge from an examination of spirit-specimens, presents no special peculiarities; it is not elevated above the orifice of the tube, but rests immediately upon it. The base of the tube is modified for the reception of a special structure; and if we may judge from the analogy of such a species as *Pedicellina gracilis*, Sars †, it must be muscular in character, and probably much more powerful and highly organized, as it is much larger than the kindred structure which occurs in the latter. If it be muscular it must secure free mobility to the polypide in conjunction with the protection afforded by the solid covering, and

* See 'Annals' for August 1882.

† In this form the mobility resides in the enlarged cylindrical base, the stem merely bending from the bottom, and the upper portions being chitinous and rigid.

a colony of *Pedicellinopsis* in health and vigour must present a strange scene of unrest and lively movement. We may hope that Mr. Wilson may yet have an opportunity of examining the species alive and studying its habits.

This localization of the muscular power seems to me to be fairly accounted a generic character; and I should be disposed to separate *Pedicellina gracilis* from the species in which it is diffused and in which there are no chitinous elements. At the same time it must be remembered that Leidy has described an American form very closely resembling *P. gracilis*, in which the basal expansion is present, while at the same time the whole stem is highly flexible and often becomes "more or less revolute"*. This is certainly a transition form. The distinctive characteristics of *Pedicellinopsis* are the arborescent form (which is by no means comparable with the mere ordinary variations in habit amongst the calcareous Cheilostomata), the specialized muscular structure, and (primarily) the highly developed periderm. In the localization of the muscular power this genus agrees with *Pedicellina gracilis* and with the remarkable Arctic genus *Barentsia*, mihi. In the possession of the first of the characters named it stands alone amongst the tribe; the last it shares (though with an important difference) with *Urnatella*, Leidy, a very interesting and beautiful form from the American fresh waters.

Pedicellinopsis fruticosa, n. sp. (Pl. XIV. figs. 3-3 c.)

Zoarium erect, consisting of a number of stout chitinous stems rising from a mat of tubular root-fibres, and sending off branches sparingly and irregularly, the whole forming a bushy shrub-like growth. *Polypides* borne on the summit of tall chitinous tubes, obliquely truncate at the top, and produced at the upper side into a sharp spinous projection, terminating below in large turbinate expansions with an opaque-white core and chitinous envelope, annulated throughout, which are attached to the stem by the inner side towards the base, and are thickly crowded upon it; body of the polypide cup-shaped, whitish, ventricose on one side and almost straight on the other; tentacles (probably) about twenty; the tubes traversed by four double lines, the spaces between them being occupied by a row of minute disks, which project from the surface. Height of the zoarium about one inch.

Loc. Port Phillip Heads (*J. B. Wilson*).

The tubes are densely crowded on the stems, which they

* See his paper entitled "*Urnatella gracilis*, a Freshwater Polyzoan," Journ. Ac. Nat. Sci. Philad. vol. ix.

clothe throughout their whole length; they are disposed somewhat irregularly in whorls. The basal enlargements are closely packed together, and almost conceal the surface of the stem. There is little branching; near the base the stem divides into two principal shoots, which give off laterals occasionally, but there is no definiteness in the plan of the ramification. The whole surface of the tubes is finely lineated longitudinally. A very marked character of the species is the obliquely truncate extremity of the tube, which is produced on one side into a strong spike-like projection. Towards the base the stem gives off a large number of chitinous fibres, which form a kind of adherent disk.

The whole structure recalls very forcibly one of the Tubularian Hydroids.

Group *ECTOPROCTA*.

Suborder CTENOSTOMATA.

Family Flustrellidæ.

FLUSTRELLA, Gray.

Flustrella hispida, Fabricius, form *cylindrica*.
(Pl. XIV. figs. 1, 1a.)

Zoarium erect, much branched; stem and branches cylindrical, composed of rather firm chitinous material. *Zoecia* disposed round the cylinder in six linear series, those of the neighbouring series alternating, large, regularly ovate, convex in front; surface smooth, round the margin a large number (15-18) of tapering acuminate spines, with an enlarged base, which bend inward over the front wall, but without meeting; orifice close to the upper extremity of the cell, bordered above and below by a thin horny rib; immediately above it a few (usually three) erect spinules; numerous large spines, springing from a kind of boss, scattered over the interspaces between the cells.

Loc. Port Phillip Heads (*J. B. Wilson*).

Range. Northern and Arctic seas, Britain, France (S.W.).

This is a very remarkable form, and for some time I was quite disposed to regard it as a distinct species; but a careful examination of the cell has convinced me that in this essential element of the structure there are no characters to separate it from the common *F. hispida* of our English coasts. The difference in habit and external appearance, striking as it is, has a parallel in many other cases, and is merely varietal.

Similar diversities in the mode of growth are of frequent occurrence within the limits of a species amongst the Cheilostomata, and in the Ctenostomatous group *Alcyonidium hirsutum* is found as a gelatinous crust and as an erect palmate expansion with many lobate branches. In the present case the zoarium seems to be firmer and less fleshy than in the crustaceous condition, and is of a rather dark horn-colour. The branching is irregular; in the largest specimen I have seen the stem divides dichotomously near the base, the secondary shoots dividing into tall flexuous branches, which bear numerous short branchlets. The branches are slightly attenuated and smooth at the base. There is always much variability in the number of the spines, and in English specimens they are often very much confined to the oral region, but they are also found surrounding the cell. In the Australian variety they are few in number and small above the orifice, but form a regular line round the margin of the cell, and bend in over the front of it.

Flustrella dichotoma, v. Suhr (sp.).
(Pl. XIV. figs. 2 a, 2 b.)

Verrucularia dichotoma, v. Suhr, Ratisbon Flora (1834), p. 725, tab. i. fig. 9, a, a.

Farciminaria dichotoma, Busk, Quart. Journ. Microscop. Sc., "Zoo-phytology."

Zoarium erect, much branched di- and trichotomously, the terminal branchlets generally trifid; stem and branches slender, cylindrical, composed of a transparent membranous material; attains a height of about 2 inches. *Zoœcia* arranged in six series, those of neighbouring series alternating, very regularly ovate, bounded by a strongly marked dark line, very convex; surface smooth, destitute of spines, prolonged below into a kind of peduncle; orifice placed a little way below the top of the cell, bilabiate, with a dark chitinous border. Between the rows of cells a narrow smooth interspace divided at intervals by transverse dark lines (? septa).

Loc. Port Phillip, Australia (*Kirchenpauer*); Port Phillip Heads (*J. B. Wilson*).

This form, originally described by v. Suhr as a *Fucus*, was referred by Busk to his family *Farciminariidæ*, and placed in the genus *Farciminaria*. Owing probably to the dried condition of his specimens the latter writer has overlooked the Ctenostomatous structure of the orifice, which agrees in all respects with that of *Flustrella*. In the characters of the zoœcium and the general habit this species approaches the

cylindrical form of *Flustrella hispida* just described, and must rank in the same genus.

The cells in the same longitudinal series are not in immediate contact, but are connected one with the other by a peduncular extension, which is bounded like the cell itself by a dark reddish-brown line. Nor are the cells in neighbouring rows united laterally, a narrow interspace lying between the series and extending throughout the length of the branch.

In the isolation of the cells this species differs from *F. hispida*. There is no true joint at the origin of the branches, but merely a constriction, and the zoecia run on continuously.

This form and the preceding illustrate a very different phase of the genus *Flustrella* from that to which we have been accustomed, and show that it has a wide geographical range.

Suborder CHEILOSTOMATA.

Family Cellulariidae.

BUGULA, Oken.

Bugula uniserialis, n. sp. (Pl. XIII. fig. 8.)

Zoarium minute, composed of geniculate, slightly branched shoots of transparent texture and a delicate horn-colour; branches given off sparingly from about the middle of the dorsal surface of a cell. *Zoecia* uniserial, bent alternately to opposite sides, so as to present a zigzagged appearance, each cell originating on the dorsal surface of the one beneath it, immediately below the top and directed obliquely outwards, boat-shaped, of equal width in the upper portion, slightly contracted below; aperture occupying the whole front, and closed by a transparent membrane; margin thin, running out above at each side into a sharp spinous projection; at the top of each cell a very minute articulated *avicularium*, placed just below the upper margin and usually about the middle of it, well rounded behind, with a rather long back sloping down to a well-developed beak, mounted on a rather prominent peduncle. *Oecium* helmet-shaped, smooth and shining, placed on the side of the cell close to the top, and overhanging the orifice more or less.

Loc. Western Australia, on weed (*Miss E. Gore*).

This species is probably the minutest of its tribe (so far as known), and is very scantily branched and simple in habit.

Though the uniserial and geniculate character of the cells

confers upon it a marked individuality, it is really a very typical *Bugula*, so far as all the essential elements of structure are concerned.

Family Cellariidæ.

CELLARIA (part.), Lamouroux.

Cellaria fistulosa, var. *australis*, MacGillivray.

(Pl. XIV. figs. 4, 4 a, 4 b.)

Zoarium much and irregularly branched, consisting of stout, unjointed, cylindrical stems (made up of as many as ten rows of cells), often of considerable length, tapering slightly downwards, from which similar shoots are given off without regularity on all sides, originating in a horny base, which rises in all cases from the centre of a zoecium; the whole rooted by a mass of tubular fibres. *Zoecia* very regularly six-sided, usually truncate above and below, contiguous in the same line; of considerable depth, the walls sloping inward and minutely pitted, slightly crenate at the top; area very small, occupying the lower half of the cell; orifice central, arched above, the lower lip carried up into a very prominent mucronate projection, rounded at the top, a small denticle on each side of it; above the orifice a large circular oöcial opening. *Avicularium* in the line of the cells, placed on a transversely oblong area, suberect; mandible very wide and shallow, arched above and straight below, directed upward.

Loc. Victoria (*MacGillivray*); Port Phillip Heads (*J. B. Wilson*).

This form is described by MacGillivray as *C. fistulosa*, var. *australis*; but the differences between it and the normal *C. fistulosa* are such as to raise a doubt whether it would not more properly be ranked as a distinct species.

I am unable to say whether the peculiar habit of growth which characterizes all the specimens I have seen is constant; but if so, it is a point of considerable importance. The jointing of the stem, by which it is divided into definite segments (or internodes) in the ordinary forms of *Cellaria*, has disappeared, and with it the regular dichotomous ramification. The shoots are continuous throughout, and the branches are given off irregularly, each of them originating from the centre of one of the zoecia, to which it is attached by a chitinous base (Pl. XIV. fig. 4 a).

The large size of the cylinders is also a distinctive point, for though there is considerable variability in this respect in

C. fistulosa, it never, I believe, makes any approach to the size and stoutness of habit which we find in the present form. But the most important differences are found in the cell. The orifice is placed very low down, about the centre of it; the space above it is occupied by the opening to the oecium, which is very large and circular in form. Round the upper part of the orifice there is a kind of border, which seems to pass downward behind it.

The lower margin is elevated into a mucronate process, which more or less conceals a considerable portion of the opening, and in each corner, between it and the side walls of the orifice, is a conspicuous white denticle. The mucronate extension of the peristome is very conspicuous when the cell is viewed in profile. In *C. fistulosa* the lower margin is all but straight, and the denticles are (so far as my experience goes) wanting. The avicularium resembles in general character that of *C. fistulosa*, but it is very much wider and almost erect and has an extremely shallow mandible; the area on which it is placed is also of a different shape.

In spirit-specimens a delicate membrane is present, which covers the whole of the front of the cell (including the ovarian opening), with the exception of the oral operculum.

EXPLANATION OF THE PLATES.

PLATE XIII.

- Fig. 1. *Membranipora marginella*, n. sp.
 Fig. 2. *Membranipora favus*, n. sp.
 Fig. 3. *Microporella violacea*, Johnston, form *plagiopora*, Busk.
 Fig. 4. *Lepralia robusta*, n. sp.
 Fig. 5. *Porella malleolus*, n. sp.
 Fig. 6. *Smittia trispinosa*, Johnston, form *binucronata*, n.
 Figs. 7, 7 a. *Smittia trispinosa*, Johnston, var. i.

PLATE XIV.

- Fig. 1. *Flustrella hispida*, Fabr., form *cylindrica*, n. 1 a. Nat. size.
 Figs. 2, 2 a. *Flustrella dichotoma*, v. Suhr (sp.); zoecia, magnified. 2 b. Nat. size.
 Fig. 3. *Pedicellinopsis fruticosa*, n. gen. and sp.: group of polypides. 3 a. Nat. size (about). 3 b. Two polypides. 3 c. Portion of tube.
 Fig. 4. *Cellaria fistulosa*, var. *australis*, MacGillivray: zoecia, magnified. 4 a. A single cell, showing the origin of a branch. 4 b. Nat. size, showing the peculiar mode of branching.